Patent

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In Re Application of:

Jianbo Lu

Serial No. 10/708,670 Group Art Unit: 3683

Filed: 03/18/2004 Examiner: Sy, Mariano Ong

For: METHOD AND APPARATUS FOR CONTROLLING AN AUTOMOTIVE VEHICLE USING BRAKE-STEER AND NORMAL LOAD ADJUSTMENT

Attorney Docket No. 81095822FGT1904

CERTIFICATE OF MAILING/TRANSMISSION

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Date: 9-1-2006 Donna Kraft

RESPONSE TO NOTICE OF NON-COMPLIANT APPEAL BRIEF

AND CORRECTED APPEAL BRIEF

Mail Stop Appeal Brief - Patents
Commissioner for Patents
P. O. Box 1450
Alexandria, VA 22313-1450

Sir:

The following corrected Appeal Brief is submitted pursuant to the Notice of Non-Compliant Appeal Brief dated August 2, 2006, for the above-identified application.

I. Real Party in Interest

The real party in interest in this matter is Ford Global Technologies, LLC, which is a wholly owned subsidiary of Ford Motor Company both in Dearborn, Michigan (hereinafter "Ford").

II. Related Appeals and Interferences

There are no other known appeals or interferences which will directly affect or be directly affected by or have bearing on the Board's decision in the pending appeal.

III. Status of the Claims

Claims 1-49 are pending in the application. Claims 1-49 stand rejected in the Final Office Action. The rejection of each and every claim which stands rejected in this case is hereby appealed. Appellants respectfully note that no rejection has been applied to Claim 37 and Appellants therefore are uncertain as to the status of Claim 37.

IV. Status of Amendments

There have been no Amendments filed after the final rejection.

V. Summary of Claimed Subject Matter

Independent Claims 1, 14, 25, 34, and 41 are best understood with respect to Figure 10 and paragraphs 94-106 of Appellants' specification.

Claim 1 is best understood with reference to paragraph 97 at lines 1-9 with respect to the detection of a parking mode, and with reference to paragraph 101 at lines 1-7 with respect to the application of brake-steer at a first wheel to reduce vehicle turning radius. Finally, independent Claim 1 is best understood with respect to paragraph 100 at lines 1-7 with respect to increasing a normal load on at least one of the wheels simultaneously with the step of applying brake-steer.

Independent Claim 14 is best understood with respect to paragraph 97 at lines 1-9 regarding means for detecting a parking mode, and at paragraph 101 at lines 1-7 with respect to applying brake-steer while in a parking mode, and finally, at paragraph 100 at lines 1-7 with respect to increasing normal load to reduce a vehicle turning radius.

Independent Claim 25 is best understood with reference to paragraph 97 at lines 1-9 with respect to detecting a parking mode, and with reference to paragraph 105 at lines 1-9 with respect to detecting vehicle loading. Claim 25 is best understood with reference to paragraph 101 at lines 1-7 with regard to applying brake-steer in response to a parking mode and vehicle loading condition.

Independent Claim 34 is best understood with respect to paragraph 97 at lines 1-9 with regard to detecting a parking mode and at paragraph 101 at lines 1-7 with respect to applying brake-steer to reduce a turning radius. Claim 34 is further understood with respect to paragraph 101 at lines 7-9 and 16-21 with regard to applying drive torque to a second wheel of a plurality of wheels and with respect to paragraph 100 at lines 1-7 with respect to increasing normal load.

Claim 41 is best understood with respect to paragraph 97 at lines 1-9 regarding detecting a parking mode, and with respect to paragraph 107 at lines 1-9 regarding determining vehicle loading condition, and finally, at paragraph 101 at lines 1-7 regarding the applying of brake-steer to the vehicle wheels in response to a parking mode a vehicle loading conditions.

VI. Grounds of Rejection to be Reviewed on Appeal

The following issue is presented in this appeal:

1. Are Claims 1-6, 8-10, 12, 14-20, 22, 23, 25, 26, 28, 30-32, 34, 35, 38, 39, 41-44 and 47 properly rejected under 35 U.S.C. §103(a) as being unpatentable over Wessman (US6,612,394) in view of Fukushima (US4,903,983)?

2. Are Claims 7, 21, 33, 40, 45, 46, and 49 properly rejected under 35 U.S.C. §103(a) as being unpatentable over Wessman in view of Fukushima and further in view of Krueger (US6,481,606)?

3. Are Claims 11, 24, and 27 properly rejected under 35 U.S.C. §103(a) as being unpatentable over Wessman in view of Fukushima and further in view of Urovy (US5,307,888)?

4. Are Claims 13 and 36 properly rejected under 35 U.S.C. §103(a) as being unpatentable over Wessman in view of Fukushima and further in view of Mine (US5,515,277)?

5. Are Claims 29 and 48 properly rejected under 35 U.S.C. §103(a) as being unpatentable over Wessman in view of Fukushima and further in view of Nakamura (US5,408,411)?

VII. Argument

Are Claims 1-6, 8-10, 12, 14-20, 22, 23, 25, 26, 28, 30-32, 34, 35, 38, 39, 41-44 and 47 properly rejected under 35 U.S.C. §103(a) as being unpatentable over Wessman (US6,612,394) in view of Fukushima (US4,903,983)?

Claims 1-6, 8-10, 12, 14-20, 22, 23, 25, 26, 28, 30-32, 34, 35, 38, 39, 41-44 and 47

Appellants have reviewed the *Wessman* reference and can find no teaching or suggestion for detecting a parking mode. Appellants have performed a word scan on the document and cannot find the word "park" anywhere in the patent. Appellants do admit that some form of brake-steer is being applied. No teaching or suggestion is provided in the *Wessman* reference for increasing a normal load on a wheel of the vehicle during brake-steer.

The *Fukushima* reference teaches an actively controlled automotive suspension with improved cornering characteristics. The abstract of the *Fukushima* reference describes the load distribution being adjusted so that the suspension characteristics can be changed to over-steer characteristics when the vehicle speed demand is higher than a given level so as to allow drift on the vehicle at a corner. The Examiner points to Col. 2, lines 5-20, for brake-steering a vehicle. Also, the Examiner points to Col. 2, lines 11-15, for detecting a parking mode. Appellants have reviewed Col. 2, which refers to EP Application 01/93124. As stated in lines 25-30 of Col. 2, the pressure control valve is controlled to adjust the fluid pressure in the first and second fluid chambers to assist in smooth displacement of a piston within the cylinder absorbing bounding and rebounding energy from being transmitted to the vehicle body. This portion refers to a controlled suspension and not to detecting a parking mode. These passages also do not refer to simultaneously applying brake-steer and increasing a normal load on at least one of the wheels. Thus, neither of the two references teaches detecting a parking mode and simultaneously with the step of applying brake-steer increasing a normal load on at least one of the wheels. Therefore, there is no teaching or suggestion for making such a combination absent the Examiner's hindsight reconstruction. Even if a reconstruction is performed, Appellants respectfully submit that the combination does not form the present invention.

Independent Claim 14 recites detecting a parking mode and applying brake-steer to the first wheel in the parking mode and increasing a normal load on at least the first wheel to reduce a vehicle turning radius. This combination as described above with respect to Claim 1 is not taught or suggested in the two references.

Claim 25 recites detecting a parking mode, detecting a vehicle loading condition and applying brake-steer to the wheels in response to the parking mode and the vehicle loading condition. Appellants respectfully submit that neither of the three steps are taught or suggested in either of the references. Although the *Fukushima* reference teaches changing a vehicle load, no teaching or suggestion is found for detecting a vehicle loading condition and applying brake-steer to the vehicle wheels in response to the parking mode and the vehicle loading condition.

Claim 34 is another independent claim that is similar to the above claims in that Claim 34 recites detecting a parking mode. Also, Claim 34 recites applying a drive torque and increasing a normal load on at least one rear wheel of the plurality of wheels. The same arguments applied to Claim 1 also apply with respect to Claim 34. However, Claim 34 is more specific in that applying a drive torque is also set forth therein.

Claim 41 is another independent claim directed to a system for controlling an automotive vehicle. Claim 41 is similar to Claim 25 and is believed to be allowable for the same reasons set forth above with respect to Claim 25.

The dependent claims also provide further limitations to their independent claims and therefore are also believed to be allowable for the same reasons set forth above.

Are Claims 7, 21, 33, 40, 45, 46, and 49 properly rejected under 35 U.S.C. §103(a) as being unpatentable over Wessman in view of Fukushima and further in view of Krueger (US6,481,606)?

Claims 7, 21, 33, 40, 45, 46, and 49

The *Krueger* reference also does not teach or suggest the elements missing from the independent claims. Namely, the *Krueger* reference also does not teach or suggest detecting a parking mode and simultaneously applying brake-steer and increasing a normal load on at least one of the wheels. Appellants therefore submit that Claims 7, 21, 33, 40, 45, 46, and 49 are allowable, and the rejection of these claims should be withdrawn.

Are Claims 11, 24 and 27 properly rejected under 35 U.S.C. §103(a) as being unpatentable over Wessman in view of Fukushima and further in view of Urvoy (US5,307,888)?

Claims 11, 24 and 27

Claims 11, 24 and 27 refer to increasing a drive torque. Although applying differential speed to tracks of a vehicle is set forth, no teaching or suggestion is provided for detecting a parking mode and simultaneously increasing a normal load on at least one of the wheels. Applicants therefore submit that Claims 11, 24 and 27 are allowable.

Are Claims 13 and 36 properly rejected under 35 U.S.C. §103(a) as being unpatentable over Wessman in view of Fukushima and further in view of Mine (US5,515,277)?

Claims 13 and 36

The *Mine* reference also does not teach or suggest simultaneously with applying brake-steer, increasing a normal load on at least one of the wheels. Also, the *Mine* reference does not teach or suggest detecting a parking mode or applying brake-steer.

Are Claims 29 and 48 properly rejected under 35 U.S.C. §103(a) as being unpatentable over Wessman in view of Fukushima and further in view of Nakamura (US5,408,411)?

Claims 29 and 48

Nakamura does not teach determination of a wheel loading response or condition based upon a sensed wheel speed and throttle signal for the purpose of aiding parking maneuvers. Rather, Nakamura is concerned with, and teaches, methods for avoiding spinning, drifting, and substantial understeer -- all undesirable high-speed handling characteristics. Moreover, Nakamura does not teach any of the previously described limitations which are missing from Wessman and Fukushima. As a result, Claims 29 and 48 are allowable over the Examiner's rejection.

VIII. Claims Appendix

A copy of each of the claims involved in this appeal, namely Claims 1-49, is attached as a Claims Appendix.

IX. Evidence Appendix

None.

X. Related Proceedings Appendix

None.

XI. Conclusion

For the foregoing reasons, Appellants respectfully request that the Board direct the Examiner in charge of this examination to withdraw the rejections.

Please charge any fees required in the filing of this appeal to deposit account 06-1510.

Respectfully submitted,

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CLAIMS APPENDIX

1. A method of controlling an automotive vehicle having wheels comprising:

detecting a parking mode;

in the parking mode, applying brake-steer at a first wheel to reduce a vehicle turning radius; and

simultaneously with the step of applying brake-steer, increasing a normal load on at least one of the wheels.

2. A method as recited in claim 1 wherein the at least one of the wheels comprises a rear wheel.

3. A method as recited in claim 1 wherein the at least one of the wheels comprises a rear inside wheel relative to a turn.

4. A method as recited in claim 1 wherein detecting a parking mode comprises detecting a parking mode in response to a vehicle speed.

5. A method as recited in claim 1 wherein detecting a parking mode comprises detecting a parking mode in response to a steering wheel angle.

6. A method as recited in claim 1 wherein detecting a parking mode comprises detecting a parking mode in response to a vehicle speed and a steering angle.

7. A method as recited in claim 1 wherein detecting a parking mode comprises detecting a parking mode in response to a driver-actuated switch.

8. A method as recited in claim 1 wherein the step of applying brake-steer comprises applying a first brake.

9. A method as recited in claim 1 wherein the step of applying brake-steer comprises applying a first brake and a second brake to reduce the turning radius of the vehicle.

10. A method as recited in claim 1 wherein applying brake-steer comprises applying at least one brake at a first wheel to reduce a vehicle turning radius.

11. A method as recited in claim 1 wherein applying brake-steer comprises applying an increased drive torque to a second wheel relative to a first wheel.

12. A method as recited in claim 1 wherein increasing the normal load comprises controlling an active suspension.

13. A method as recited in claim 1 wherein increasing the normal load comprises controlling an air suspension.

14. A system of controlling an automotive vehicle having a plurality of brakes comprising:

means to detect a parking mode; and

a controller programmed to apply brake-steer to at least a first wheel in the parking mode, and to increase a normal load on at least the first wheel to reduce a vehicle turning radius.

15. A system as recited in claim 14 wherein the wheel comprises a rear wheel.

16. A system as recited in claim 14 wherein the at least one of the wheels comprises a rear inside wheel relative to a turn.

17. A system as recited in claim 14 further comprising an active suspension, said controller increasing the normal load by changing the active suspension.

18. A system as recited in claim 14 wherein said means to detect a parking mode comprises a vehicle speed sensor.

19. A system as recited in claim 14 wherein said means to detect a parking mode comprises a steering wheel angle sensor.

20. A system as recited in claim 14 wherein said means to detect a parking mode comprises a vehicle speed sensor and a steering wheel angle sensor.

21. A system as recited in claim 14 wherein said means to detect a parking mode comprises a driver-actuated switch.

22. A system as recited in claim 14 wherein said controller is programmed to brake-steer by applying a first brake and a second brake to reduce the turning radius of the vehicle.

23. A system as recited in claim 14 wherein said controller is programmed to apply brake-steer by applying at least one brake at a first wheel to reduce a vehicle turning radius.

24. A system as recited in claim 14 wherein said controller is programmed to apply brake-steer by applying an increased drive torque to a second wheel relative to the first wheel.

25. A method of controlling an automotive vehicle having vehicle wheels comprising:

detecting a parking mode;

detecting a vehicle loading condition; and

applying brake-steer to the vehicle wheels in response to the parking mode and the vehicle loading condition.

26. A method as recited in claim 25 wherein applying brake-steer comprises applying at least one brake at a first wheel to reduce a vehicle turning radius.

27. A method as recited in claim 25 wherein applying brake-steer comprises applying an increased drive torque to a second wheel relative to the first wheel.

28. A method as recited in claim 25 applying brake-steer comprises increasing the normal load on the rear wheels.

29. A method as recited in claim 25 wherein detecting a normal load condition comprises determining a loading response to a wheel speed and throttle signal.

30. A method as recited in claim 25 wherein detecting a parking mode comprises detecting a parking mode in response to a vehicle speed.

31. A method as recited in claim 25 wherein detecting a parking mode comprises detecting a parking mode in response to a steering wheel angle.

32. A method as recited in claim 25 wherein detecting a parking mode comprises detecting a parking mode in response to a vehicle speed and a steering angle.

33. A method as recited in claim 25 wherein detecting a parking mode comprises detecting a parking mode in response to a driver-actuated switch.

34. A method of controlling an automotive vehicle having a plurality of wheels comprising:

detecting a parking mode;

in the parking mode, applying at least one brake at a first wheel of the plurality of wheels to reduce a vehicle turning radius;

simultaneously with the step of applying at least one brake, applying drive torque to a second wheel of the plurality of wheels; and

increasing a normal load on at least one rear wheel of the plurality of wheels.

35. A method as recited in claim 34 wherein increasing the normal load comprises controlling an active suspension.

36. A method as recited in claim 34 wherein increasing the normal load comprises controlling an air suspension.

37. A method as recited in claim 34 wherein detecting a parking mode comprises detecting a parking mode in response to a vehicle speed.

38. A method as recited in claim 34 wherein detecting a parking mode comprises detecting a parking mode in response to a steering wheel angle.

39. A method as recited in claim 34 wherein detecting a parking mode comprises detecting a parking mode in response to a vehicle speed and a steering angle.

40. A method as recited in claim 34 wherein detecting a parking mode comprises detecting a parking mode in response to a driver-actuated switch.

41. A system for controlling an automotive vehicle having a brake system and vehicle wheels comprising:

means to detect a parking mode;

means to determine a vehicle loading condition; and

a controller coupled to the means to detect a parking mode and the means to determine a vehicle loading condition, said controller applying brake-steer to the vehicle wheels in response to the parking mode and the vehicle loading condition.

42. A system as recited in claim 41 wherein said means to detect a parking mode comprises a vehicle speed sensor.

43. A system as recited in claim 41 wherein said means to detect a parking mode comprises a steering wheel angle sensor.

44. A system as recited in claim 41 wherein said means to detect a parking mode comprises a vehicle speed sensor and a steering wheel angle sensor.

45. A system as recited in claim 41 wherein said means to detect a parking mode comprises a driver-actuated switch.

46. A system as recited in claim 41 wherein said means to determine a loading condition comprises a yaw stability control system.

47. A system as recited in claim 41 wherein said means to determine a loading condition comprises a load sensor.

48. A system as recited in claim 41 wherein said means to determine a loading condition comprises a plurality of wheel speed sensors and a throttle sensor.

49. A system as recited in claim 41 wherein said means to determine a loading condition comprises a suspension height sensor.

EVIDENCE APPENDIX

None.

RELATED PROCEEDINGS APPENDIX

None.